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Operating Instructions
electronic solenoid valve control type IFC 30

Driftinstruktion
Bedrijfshandleiding
Instruções de serviço
Instrucciones de servicio
Istruzioni per l`ésercizio
Instruction de service
Betriebsanleitung
Operating Instructions

Electronic
Solenoid Valve Control
Type IFC 30

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1 Safety Precautions and Warnings

IMPORTANT NOTICE!

Non-observance of the safety instructions can result in severe personal injury or property damage.

This equipment may be installed, connected, commissioned, operated and maintained by qualified and authorised personnel only, under strict observance of these operating instructions, any relevant standards and legal requirements.

Take particular note of the general and regional installation and safety regulations regarding work on high voltage installations (e.g. VDE), as well as the relevant regulations regarding the correct use of tools and personal protective gear.

Hazardous voltages are present in this electrical equipment during operation.

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1.1 Designation electrical apparatus for explosion-hazardous areas

Designation according to Directive 94/9/EC: II 3D

Sign	Signification
II	Equipment Group II
3	Equipment Category 3
D	For explosive mixtures of air and combustible dust

Particular addition to EN 60079-0 **Ex tc IIIB T80°C Dc X IP65 Ta:-5°C … +40°C**

Ex	Ex-protection at European standard
tc	Protection class: protection by enclosure, use in category 3D
IIIB	Dust-group: non-conductive dust
T80°C	Maximum surface temperature
Dc	EPL= Equipment Protection Level: Dust (II 3D)
X	Remarks for special conditions for safe use
IP 65	Ingress protection IP 65
Ta: -5°C … +40°C	Permissible operating temperature range

Areas of application

Equipment Category	Explosive dust-air mixtures (D)
Category 1	Zone 20, 21 or 22
Category 2	Zone 21 or 22
Category 3	Zone 22 not conductive dust

Equipment Group II Category 3

Equipments, they are constructively arranged to operate in agreement with the characteristic quantities given by the manufacturer and ensure a normal measure of safety.

Electrical apparatus for use in the presence of combustible dust

Equipments of this category are intended for the use in areas where you have not to calculate with an explosive atmosphere of dust whirled up. If an explosive atmosphere appears nevertheless, in all probability it will be only rare and during a short time period.

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1.2 Operating of the Unit in the add-on housing

ATTENTION!

The control may be used in normal operation only with closed lid.

For commissioning and maintenance work with power on you must make sure that no explosive atmosphere of dust-air mixture is present or could occur.

Otherwise the lid may be opened only if the power is switched off.

At least the ingress protection IP54 must be guaranteed.

1.3 Remarks for special conditions for safe use in explosion-hazardous areas zone 22 for the control IFC 30-E (add-on housing polycarbonate)

ATTENTION!

1. Permissible operating temperature range Ta: -10°C to +40°C.
2. The control has to be installed within the visual range and must be protected from any mechanical damage.
3. The control must be protected from ultraviolet light (daylight or ultraviolet light from lamps) respectively be mounted in a protected place.
4. Avoid dust deposits on the unit.
5. To avoid electrostatic charging clean the unit with a damp cloth only. Rubbing with nonconductive materials must be strictly avoided.

2 Use as agreed

NOTE!

If used incorrectly application-related dangers may arise.

The control was developed for the cyclic dedusting of filterelements with compressed air impulses.

Up to 24 solenoid valves can be controlled in rotation, with adjustable impulse and delay timing periods.

A 24VDC-Remote control input is available for an external start.
A potential free relay contact is availabe to give an operatinal message to a host system.

The control must not be operated outside of its electrical, thermal and mechanical performance limits.

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3 Technical Data

Supply Voltage (see type plate)	**220 to 240VAC 50/60Hz**	**110 to 120VAC 50/60Hz**	**24VDC**
voltage tolerance	+/- 5%		24-32VDC
	switchable with mains switch		
fuse	315mA medium slow	630mA medium slow	1,6A medium slow
quiescent current consumption	typical 40mA	typical 80mA	typical 60mA

Type	**IFC 30 E in add-on housing polycarbonate**
Outputs	3-30 solenoid valve outputs 24VDC, output power max. 24W/1A, activated manually by means of a multi-contact switch. All outputs are suppressed with a recovery diode.
Impulse period	Adjustable from 60 to 600 ms, indicated by red LED
Delay period	Adjustable from 6 to 60 s, indicated by green LED
Post cleaning	Selectable from 0 to 5 cycles, delay period is automatically reduced
Indication by LEDs	Red: wire breakage, lack of air Green: operational signal (active)
Signal output	Operational signal, potential-free relay contact, normally open, contact load max. I = 0,5A, U = 230VAC
Control inputs 24VDC	R: Remote control input, yellow LED, P: Input for pressure switch, yellow LED, current consumption approx. 15mA
Supply voltage for external triggers	24VDC, 50mA max.
Housing material	Polycarbonate
Colour	RAL 7032 (pebble gray), transparent lid
Installation	Wall installation

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Type	**IFC 30 E** **in add-on housing polycarbonate**
Ingress protection	IP65 to EN 60529
Dimensions (W x H x D)	375 x 250 x 150 mm
Weight	5,6 kg
Cable entries	4 x M16, 4 x M20,
Clamp range of Cable entries	M16 for 4,0 to 8,0 mm M20 for 6,5 to 12,0 mm or 10,0 to 14mm
Connection cross section	0,2 to 2,5 mm²
unit marking	 II 3D T Ex tc IIIB T80°C Dc X IP65 Ta: -5°C …+40°C
Maximum surface temperature ***T*** of the housing (Category 3D) at 40°C ambient temperature	80°C
Permissible operating temperature	explosion-hazardous area zone 22: Ta: - 5 °C to + 40°C Not explosion-hazardous area: - 20 °C to + 40°C
Conformity	• EU- Directive 2006/95/EG (EN 60204-1) • EU- Directive 2004/108/EG (EN 61000-6-1, EN 61000-6-2, EN 55014-1) • Ex- Directive 94/9/EG (EN 60079-0, EN60079-31)
	CE

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4 Installation

ATTENTION!

Observe relevant regulations!

For use in Ex-Area you have to check whether the unit is suitable for the application.

(refer to type plate and technical data)

In general

The control is suitable for the installation in an industry plant.

To be used in explosion-hazardous area (Ex-Area) Zone 22 not conductive dust and in not Ex-Area.

After removal the lid the mounting holes are accessible.

The control is to be installed in a vibration-free location.

Add-on

housing

polyester

The polyester add-on housing can be installed indoors and outdoors under hard conditions. The mechanical resistance is high. Polyester is absolutely corrosion-proof and high-resistant against aggressive chemical mediums.

It has to be installed within the visual range and must be protected from a mechanical damage.

For the installation outdoors the housing must be protect for weather influences with a roof or similar.

For use in explosion-hazardous area the remarks in chapter 1.3 must be observe.

Refer to drawing 4.1 for mounting dimensions

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4.1 Safety notes for the installation

IMPORTANT NOTICE!

Install according to the manufacturer´s instructions and the respective national regulations and provisions as well as the relevant installation regulations.

Connect and carry the ground wire.

4.2 Safety notes for the installation of the add-on housing

IMPORTANT NOTICE!

The unit must be installed such that the degree of protection IP 65 to EN 60529 is guaranteed (state of delivery).

Therefore it is important

to fix all screws of the lid,

to mount the cable entries competently,

to close unnecessary cable entries with stoppers,

to use in the ex-area only cable glands and stoppers approved for this area.

The requirements of the EN 60079-14 must be met.

In addition, only the connection of permanently installed cable and wire is allowed. A corresponding strain relief must be ensured.

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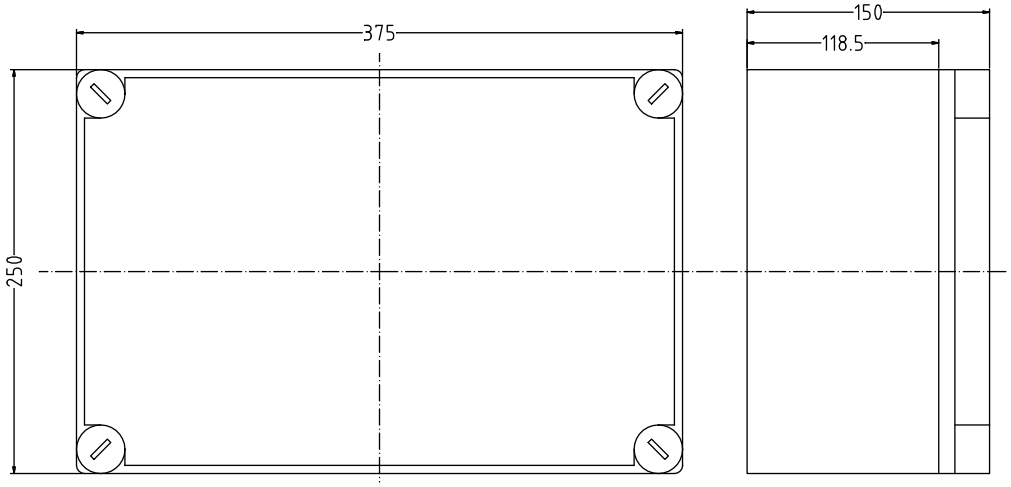
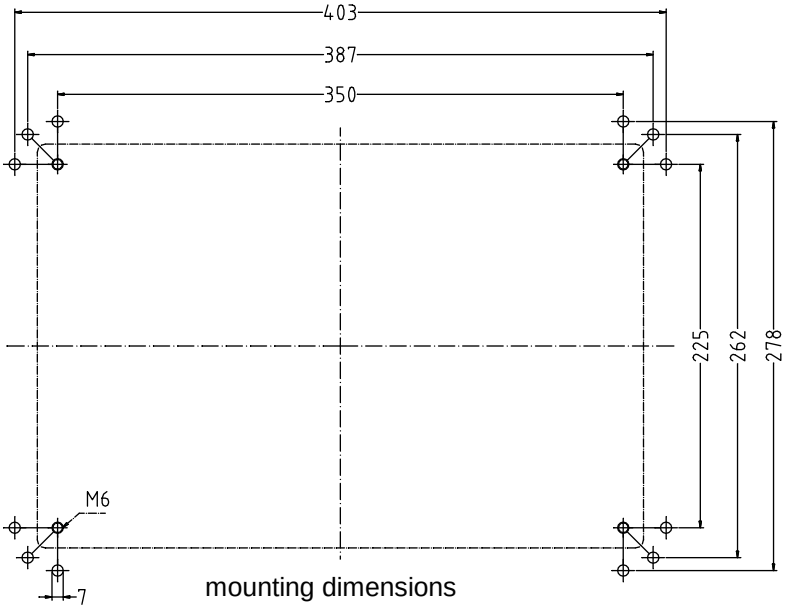


cable entries from below



mounting dimensions

Illustration 4.1: Add on housing polycarbonate

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5 Electrical Connection

IMPORTANT NOTICE!

The unit may only be connected to the supply voltage as indicated on the type plate.

The connection of 115 VAC or 230 VAC to a control for 24 VDC will lead to destruction of the entire control unit.

General

The control is to be connected according to drawing 5.1.
The values given in the technical specification are to be observed.
(refer to Section 3).

Supply Voltage

Supply voltage is to be connected to contact strip (1). L and N or L+ and M.
(refer to drawing 6.1)

Solenoid Valves

The solenoid valves are to be connected to contacts 1 to 30 on contact strip (2). Paid attention on a uniform distribution of the solenoid valves to the 3 output groups.

For example:
There are to connect 8 solenoid vales per output group if you have 24 solenoid vales complete.
Valve 1-8 to contact 1-8
Valve 9-16 to contact 11-18
Valve 17-24 to contact 21-28

The plus poles of the solenoid valves must be bound together and connected to contacts +.

Connect the ground wire to PE on contact strip (1). It is also possible to connect the ground wire on the mounting plate.

The power of the conntected solenoid valves may not be exceeded the maximum output power.

Operating Signal Output

The operating signal output is available at contacts 31 and 32 on contact strip (3). It´s a potential-free normally open relay contact
Refer to Section 7.2.

Remote control Input (R)

Contact 34 on contact strip (3) is for connection of the remote control signal.
Refer also to Section 7.1.

Pressure Switch Input (P)

Contact 33 on contact strip (3) is for connection of the pressure switch signal for pneumatic monitoring.
Refer also to Section 7.3.

Supply of power to the triggers is available from contact 35, plus 24VDC and contact 36, 0V potential.

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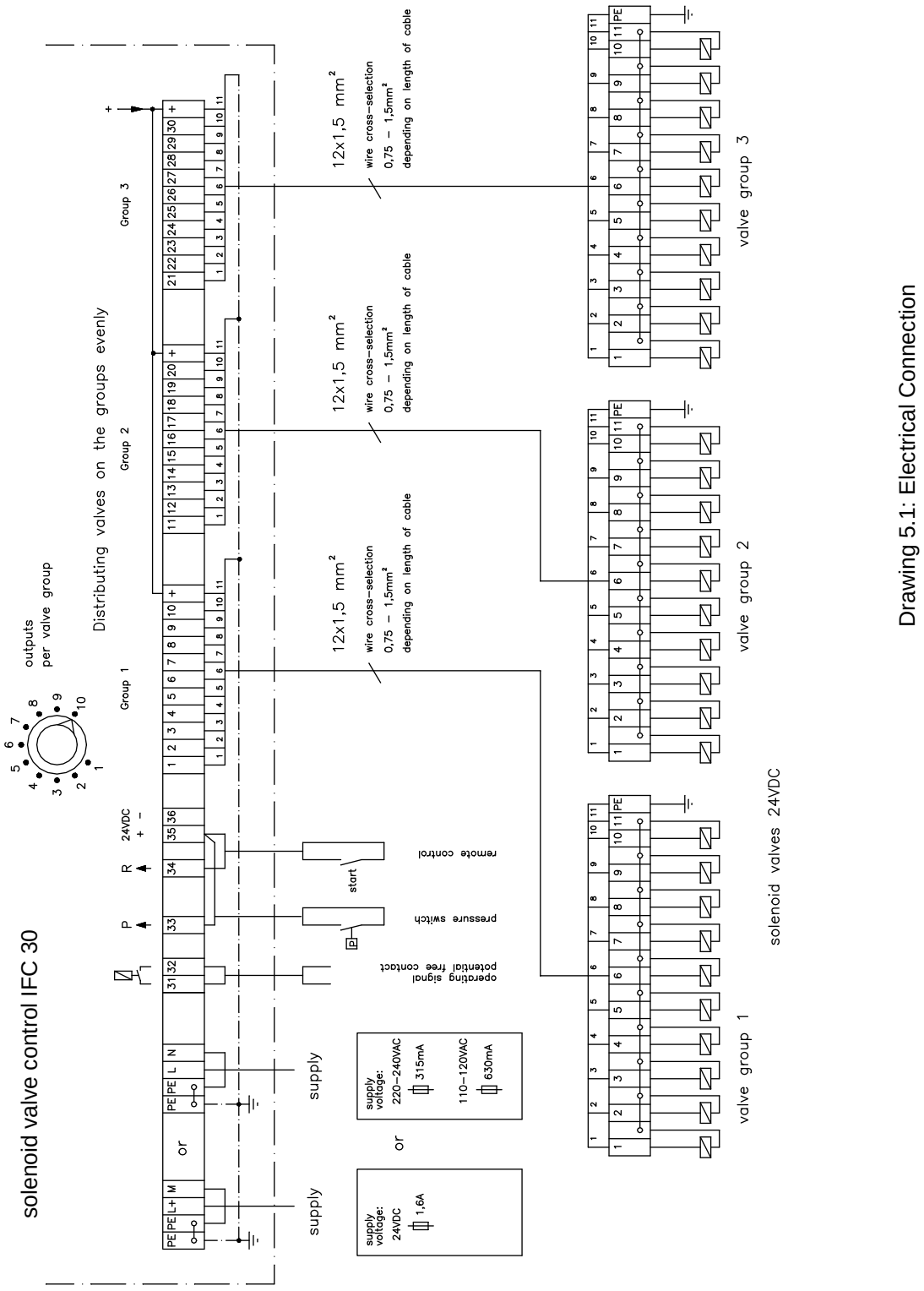

Drawing 5.1: Electrical Connection

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6 Commissioning

ATTENTION!

For commissioning and maintenance work you must make sure that no explosive atmosphere of dust-air mixture is present or could occur.

Otherwise the lid may be opened only if the power is switched off.

The control must not be operated outside of its electrical, thermal and mechanical performance limits.

The following points are to be carried out in the sequence given for initial operation: (Refer to drawing 6.1)

- Set the ON/OFF switch (6) to OFF
- Check with the type plate which supply voltage is suitable for the unit on hand. 110-120VAC and 220-240VAC **or** 24VDC
- Set the mains voltage switch (4) to the correct setting for the available supply voltage (110-120V or 220-240VAC)
- Ensure that the correct fuse is inserted. Refer to the technical data.
- Pre-select the outputs per group to be controlled by setting multi-position switch (7), as desired
- Set the potentiometers delay and impulse time (10)(11) according to the specifications of the filter manufacturers.
- Select the operating modi and monitoring functions required by means of the DIP switches (19):

DIP switch 1 ON	⇨	start the controller either via remote control or pressure difference switch (refer to Section 7.1).
DIP switch 1 OFF	⇨	Controller direct start at connecting supply voltage
DIP switch 2 ON	⇨	Nominal operating pressure test (refer to Section 7.3). Pressure switch on storage column must be in place.
DIP switch 2 OFF	⇨	Nominal operating pressure is not tested.
DIP switch 3	⇨	no function

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- Pre-select the number of post cleaning cycles required via multi-position switch (12) (refer to Section 7.4). Post cleaning is only available when the remote control function, DIP switch 3 ON is used.
- Re-check that the controller is correctly connected in accordance with the connection diagramme, Drawing 5.1.
- Connect the supply voltage according to the type plate and activate the controller by using the ON/OFF switch (6).

Signalling

The following LED's will come on after the controller has been switched on :

Active (green)	(17)	if remote control function is active, start via 1 signal on input "R"(refer to Section 7.1)
next output (green)	(8)	
operational message (green)	(20)	only if controller is ACTIVE
signal "P" (yellow) pessure switch input	(21)	dependents on switch status of connected trigger
signal "R" (yellow) remote control	(22)	dependents on switch status of connected trigger
output group 1 (yellow)	(23)	

Start with remote control

The dedusting process commences as soon as 1 signal is detected at input R. The connected solenoid vales will be controlled with the selected impuls-delay periode. 0 signal at input R stops the valve control.
If post cleaning cycles are pre-selected, the valve control stops after it has finished the post cleaning. The control continues with a renewed start.

remote control OFF

The dedusting commences as soon as the supply voltage is connected. The connected solenoid vales will be controlled with the selected impuls-delay periode.

- Check that the solenoid valves are working correctly
  At a fault-free drive the operational message contact remains closed for the complete run. LED (20) lights without interruption.

- After completing the commissioning:
  Screw the lid on again and check the cable entries. Not needed cable entries must be closed with stoppers.

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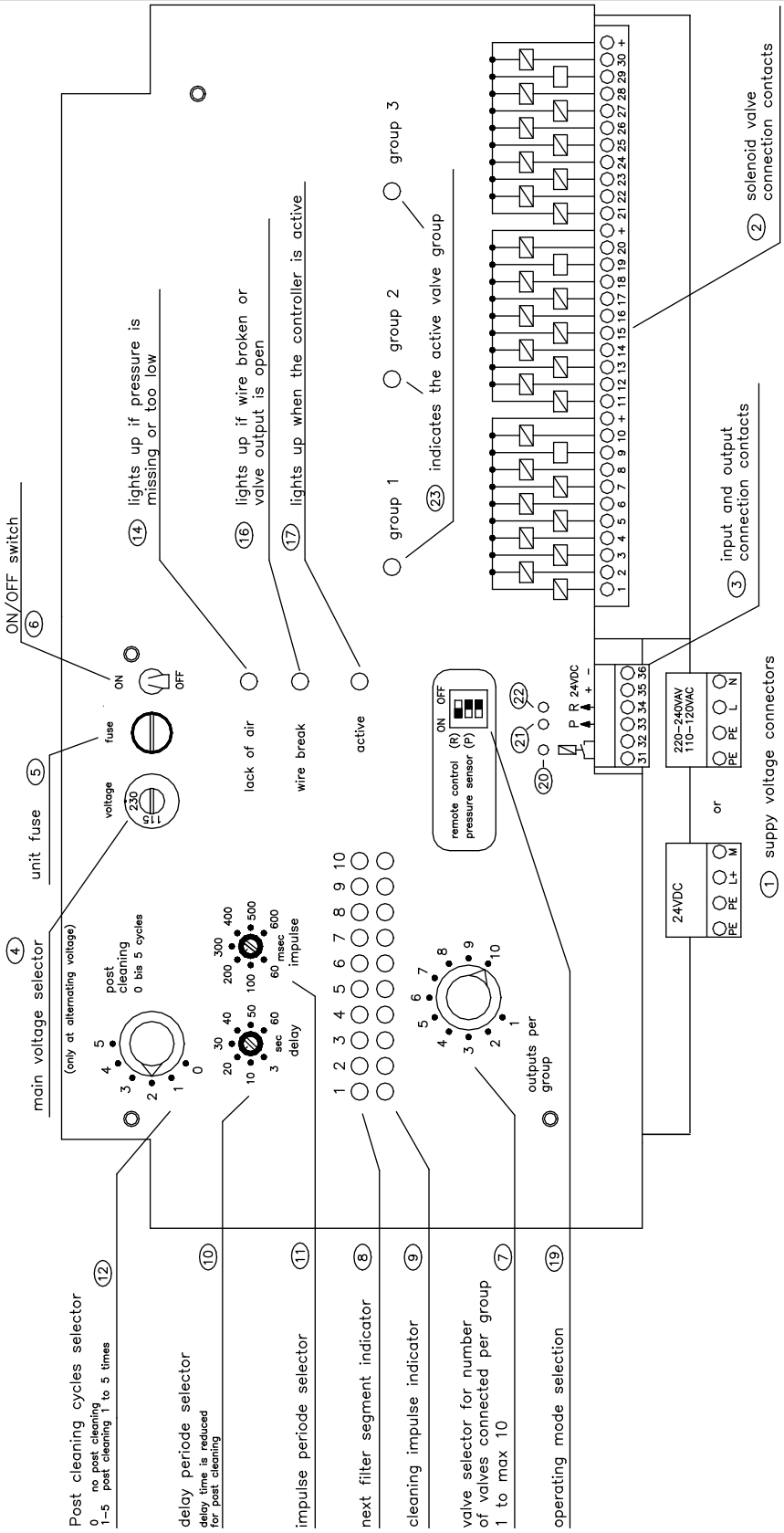

Drawing 6.1: Front panel overview

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7 Control and Signal Functions

7.1 Remote Control Input R

It is possible to control the controller remotely via input R on contact strip (3). The following switch types may be connected to input R :

1. potential-free contact (switch or relay);
2. switch with electronic output PNP;
3. 12 to 30 VDC against 0V.

The input is reverse polarity safe.

The remote control function is activated by setting DIP switch 1 (19) to ON and de-activated when that switch is set to OFF. The DIP switch position may be changed whilst the controller is in operation.

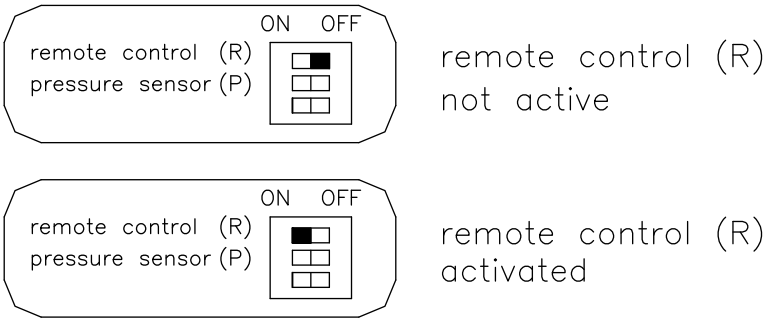

Illustration 7.1: Possible settings of DIP switch 1

If the remote control function is activated, the dedusting process commences as soon as 1 signal is detected at input R. LED (22) lights up.

If the remote control function is not active, then dedusting commences as soon as the supply voltage is connected.

Input R may alternatively be used for connection of a pressure difference switch. This starts the dedusting process in dependence to the filter resistance.

If the pressure difference switch is to be connected to input R as well as the remote control, then the remote control start signal must be wired in series with the pressure difference switch contact.

7.2 Operational Message

A potential-free normally open relay contact is available on contact strip (3) for indicating the operational status.

The operating relay only closes if the controller is switched to ACTIVE. If a fault occurs, such as overload or wire break, the operating relay will open.

The controller will continue operation without interruption.

The relay will close again as soon as no further faults are detected. The green LED (20), above contact strip (3) will light up.

7.3 Pressure Switch Input P

Nominal Operating Pressure Test

The nominal operating pressure in the pressure storage column can be monitored by connecting a pressure sensitive switch to input "P", contact strip (3).

The following switch types may be connected to input "P" :

1. Potential free contact (normal pressure switch);
2. Switch with electronic output PNP;
3. Direct current between 12 and 30VDC, against 0V.

The input is reverse polarity proof.

The nominal operating pressure test function is activated by setting DIP switch 2 (19) to ON, it is de-activated by setting this same DIP switch to the OFF position. The DIP switch position may be changed whilst the controller is in operation.

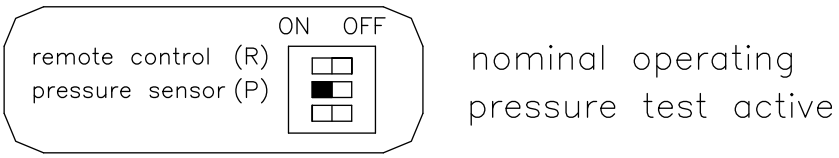

Illustration 7.2: DIP switch 2 settings

The nominal operating pressure test occurs at the end of the delay.

If a signal is not detected at input "P", the LED "lack of air" (14) will light up. This indicator goes off if a 1 signal is detected at input "P" when the test is repeated at the end of the following delay.

If a 1 signal is detected at input "P", yellow LED (21) will light up.

7.4 Post Cleaning

The "post-cleaning" selector switch (12) may be set to values between 0 and 5 and enables post cleaning of the filter after the controller has been switched off via input "R" with reduced delay period.

The number of cleaning cycles can be set to between 0 and 5 via the selector switch. If this switch is set to "0", there will be no post cleaning. If the controller is switched OFF, it will come to a standstill immediately following the end of any dedusting impulse (operating mode STANDBY").

If the selector switch is set to values between 1 and 5, the controller will switch over to post cleaning. Any sequence which has already commenced will be further processed using the shortened delay period. Post cleaning itself commences with the beginning of the next cycle.

8 Fault Messages

The fault indication “wire break” is assigned to the disturbed output. This indicator will go off when the next non-faulty impulse is received.

For example:
The message “wire break” occurs after the output 5 was controlled. After controlling the output 6 the LED wire break goes off again.
From this results that the wire break fault was causes from the solenoid valve 5.

8.1 Causes of fault and elimination

Messages	Indication	Causes of Fault	Elemination
wire break	LED red This indicator will go off when the next non-faulty impulse is received	No output load during the control impulse or short-circuited valve output.	• Check the adjusting of the multi-position switch (7). The number of connected valves must agree with the adjusting of the multi-position switch • Check the valve connection • Check the valve
lack of air	LED red	The pressure switch input P indicates no signal at the end of the delay time.	• Check the compressed air and the pressure switch • If no monitoring of the compressed air shall be carried out, switch the DIP switches 2 (19) to the OFF position.

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EC Declaration of Conformity
electronic solenoid valve control type IFC 30

Herewith we declare that the electronic solenoid valve control

IFC 30 in add-on housing polycarbonate IP65

comply with following relevant regulations:

- EC directive **2004/108/EG**
- *(on electromagnetic compatibility)*
- EC low voltage directive **2006/95/EG**
- EC directive **94/9/EG**
- *(Equipment and protective systems intended for use in potentially explosive atmospheres)*

Applied standards:

- EN 61000-6-1
- EN 61000-6-2
- EN 55014-1
- EN 60204-1
- EN 60079-0
- EN 60079-31

Hude, 26.02.2015

(R. Hainke – General Manager)